

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions of claims in the application:

Listing of Claims:

1. (Currently amended) A system that optimizes industrial business operations, comprising:
a processor;
a memory communicatively coupled to the processor, the memory having stored therein
computer-executable instructions configured to implement the industrial business operations
including:

a component that receives data relating to [at least one state of a subset of] a plurality of
machines [or components] that are part of the industrial business operations;

[a prognostics engine that infers at least one future state of at least a subset of the
operations based in part on the received data, the prognostics engine comprising a plurality of
intelligent software machine agents and business agents that serve as proxies for at least the
subset of machines, for modeling and representing interactions with one another, and for
facilitating convergence on modification and control of the subset of machines, for efficiently
optimizing industrial business operations and]

an optimization component that selects a desired operating point as an optimum
performance point within an allowable range of operation about a system set point according to
performance characteristic associated with [at least one of the components in the system] the
industrial business operations, and controls the industrial business operations in part [at least one
component] according to the desired operating point; and

a correlation engine that analyzes data to correlate operation among the plurality of
machines for a global optimization of the industrial business operations as a whole.

2. (Currently amended) The system of claim 1, further comprising a prognostics engine that
infers a future state of a subset of operations for the plurality of machines based in part on
received data. host computer that executes the prognostic engine.

3. (Currently amended) The system of claim 2 1, the prognostic engine comprising a classifier.
4. (Currently amended) The system of claim 1, at least a subset of the plurality of machines comprising prognostic components that collaborate in a distributed manner.
5. (Currently amended) The system of claim 4, at least one of the prognostics prognostic components performs prognoses for a cluster of machines.
6. (Currently amended) The system of claim 4, the prognosis prognostic engine and the prognostic components collaborating to improve operating rate of at least a subset of the plurality of machines.
7. (Original) The system of claim 3, the classifier performs a probabilistic analysis in connection with the inference.
8. (Currently amended) The system of claim 1, at least a subset of the plurality of machines and/or components are represented by intelligent agents.
9. (Currently amended) The system of claim 1, at least a subset of the plurality of machines and/or components are physically located remote from one another.

10. (Currently amended) A method that optimizes assets in an industrial automation system environment, comprising:
employing a processor executing computer executable instructions stored on a computer readable storage medium to implement the following acts:

receiving and analyzing in real-time data relating to diagnoses and prognoses of operational aspects of a subset of machines that are part of the industrial automation system;

modeling and representing interactions of the subset of machines, for facilitating convergence on modification and control of the subset of machines;

modifying asset utilization in the industrial automation system based at least in part as a function of the analyzed diagnostic and prognostic machine data;

correlating at least two of motor efficiency information, pump efficiency information, and motor drive efficiency information [in order] to derive correlated system efficiency information and optimize the entire industrial automation system as a whole;

selecting a desired operating point as an optimum efficiency point within an allowable range of operation about a system set point associated with the industrial automation system according to the correlated system efficiency information; and

controlling at least one machine according to the desired operating point.

11. (Cancelled)

12. (Original) The method of claim 10, further comprising employing an options based analysis in connection with asset management.

13. (Currently amended) The method of claim 10, further comprising obtaining the system set point and the allowable range of operation from a user.

14. (Cancelled)

15. (Currently amended) The method of claim 10, wherein controlling the industrial automation system according to the desired operating point comprises providing a motor speed

signal to a [the] motor drive associated with the industrial automation system according to the desired operating point.

16. (Previously Presented) The method of claim 10, further comprising obtaining at least one of the efficiency information, the allowable range, and the system set point from a user.

17. (Previously Presented) The method of claim 10, further comprising obtaining at least one of the efficiency information, the allowable range, and the system set point from a host computer via a network.

18. (Cancelled)

19. (Previously Presented) The method of claim 17, wherein the at least one of the efficiency information, the allowable range, and the system set point is obtained *via* wireless communications.

20. (Currently amended) The method of claim 10, further comprising obtaining at least a portion of one of the efficiency information, the allowable range, and the [system] set point from prior operation of the system.

21. (Currently amended) The method of claim 10, wherein selecting the desired operating point comprises:

correlating component performance information associated with at least two components in the system in order to derive correlated system performance information; and

selecting the desired operating point as the optimum efficiency performance point within the allowable range of operation according to the correlated system performance information.

22. (Currently amended) The method of claim [10] 21, wherein controlling the industrial automation system according to the desired operating point comprises providing [a] the set point to a controller associated with the industrial automation system according to the desired operating point.

23. (Currently amended) The method of claim 21 [12], further comprising automatically ordering an asset *via* the Internet.
24. (Original) The method of claim 21, further comprising obtaining at least one of the performance information, the allowable range, and the system set point from a host computer.
25. (Original) The method of claim 24, wherein the at least one of the performance information, the allowable range, and the system set point is obtained via a network.
26. (Original) The method of claim 25, wherein the at least one of the performance information, the allowable range, and the system set point is obtained via wireless communications.
27. (Currently amended) The method of claim 21, further comprising obtaining at least a portion of one of the performance information, the allowable range, and the [system] set point from prior operation of the industrial automation system.
28. (Original) The method of claim 21, wherein the component performance information comprises at least one of life cycle cost information, efficiency information, life expectancy information, safety information, emissions information, operational cost information, MTBF information, noise information, and vibration information.
29. (Currently amended) The method of claim 28, wherein the industrial automation system comprises a motorized pump system for pumping fluid, having an electric motor operatively coupled with a pump, and a motor drive providing electrical power to the motor, wherein the component performance information comprises efficiency information related to at least two of the motor, the pump, and the motor drive, and wherein the correlated system performance information comprises cost information related to the industrial automation system operational cost per unit of fluid pumped.

30. (Currently amended) The method of claim 10, wherein the industrial automation system comprises a motorized pump system having an electric motor operatively coupled with a pump, and a motor drive providing electrical power to the motor, and wherein [the] performance characteristics associated with a plurality of components in the industrial automation system comprises life expectancies of at least two of the motor, the pump, and the motor drive.

31. (Currently amended) The method of claim 10, wherein the industrial automation system comprises a motorized pump system having an electric motor operatively coupled with a pump, and a motor drive providing electrical power to the motor, and wherein [the] performance characteristics associated with a plurality of components in the industrial automation system comprises cost of operation associated with at least two of the motor, the pump, and the motor drive.

32. (Currently amended) The method of claim 10, wherein selecting the desired operating point comprises measuring at least one process variable from a sensor associated with the industrial automation system.

33. (Currently amended) A system that optimizes assets in an industrial automation system [environment], comprising:

processing means for processing data from a memory having stored therein computer-executable instructions configured to implement the industrial business operations including:

means for receiving and analyzing in real-time data relating to prognoses of operational aspects of machines and/or business components that are part of the industrial automation system;

means for modeling and representing interactions between the machines and/or business components;

means for regulating a subset of the machines and/or business components based at least in part as a function of [the] analyzed diagnostic and prognostic machine data;

means for correlating at least two of motor efficiency information, pump efficiency information, and motor drive efficiency information in order to derive correlated system efficiency information for optimizing an entire operation of the industrial automation system;

means for selecting a desired operating point within an allowable range of operation about a system set point according to the correlated system efficiency information; and

means for controlling at least one machine according to the desired operating point.

34. (Original) The system of claim 33 further comprising means for inferring future states of the subset of machines.

35. (Original) The system of claim 33 further comprising means for inferring future states of the subset of business components.

36. (Cancelled)

37. (Cancelled)

38. (Cancelled)

39. (Currently amended) An industrial automation layout methodology, comprising:
employing a processor executing computer executable instructions stored on a computer readable storage medium to implement the following acts:

analyzing machine related prognostic data to correlate operation among plurality of machines;

analyzing business concern data;

analyzing business objective data;

specifying machine acquisition based at least in part upon the analyses;

obtaining a system set point, an allowable range of operation and machine performance information;

selecting a desired operating point within the allowable range of operation about the system set point according to performance characteristics associated with at least one of the [components in the system] plurality of the machines; and

controlling at least one component according to the desired operating point for a global optimization of the plurality of machines as a whole.

40. (Currently amended) A computer-implemented method for ordering parts and optimizing assets in an industrial automation [environment] system comprising:
employing a processor executing computer executable instructions stored on a computer readable storage medium to implement the following acts:

automatically receiving [an] and analyzing data relating to a prognosis of a future state of the industrial automation system [a machine];

automatically inferring a failure period for at least one part of the industrial automation system machine;

automatically ordering a replacement for the at least one part prior to [the] an inferred failure period;

correlating component performance information associated with [one or more] the industrial automation system in the machine comprising a motor efficiency information, a pump efficiency information, and a motor drive efficiency information in order to derive correlated process performance information for a performance optimization of the industrial automation system as a whole; and

selecting a desired operating point as an optimum performance point within [a] an allowable range of operation according to the correlated process performance information.

41. (Original) The method of claim 40 further comprising employing an options based scheme in connection with machine management.

42. (Original) The method of claim 40 further comprising employing an options based scheme in connection with decision support.

43. (Original) The method of claim 40 further comprising employing an options based scheme in connection with asset optimization.

44. (Currently amended) A system that facilitates optimizing industrial business operations, comprising:

a processor;

a memory communicatively coupled to the processor, the memory having stored therein computer-executable instructions configured to implement the industrial business operations including:

a component that receives data relating to a state of a subset of machines [or components] that are part of the industrial business operations;

a prognostics engine that infers future state of at least a subset of the operations based in part on the received data, the prognostics engine comprising a plurality of intelligent software machine agents and business agents that serve as proxies for at least the subset of machines, for modeling and representing interactions with one another, and for facilitating convergence on modification and control of the subset of machines; and

an optimization component that selects a desired operating point as an optimum performance point within an allowable range of operation about a system set point according to performance characteristic associated with at least one of the components in the system and controls at least one component according to the desired operating point for a performance optimization of the industrial automation system as a whole.

45. (Original) The system of claim 44, the prognostic engine infers future business conditions.

46. (Original) The system of claim 45, the future business conditions comprising at least one of future raw materials and future product demand.

47. (Currently amended) A system that facilitates optimizing industrial business operations, comprising:

a processor;

a memory communicatively coupled to the processor, the memory having stored therein computer-executable instructions configured to implement the industrial business operations including:

a component that receives data relating to state of the industrial business operations;

a prognostics engine that infers future state of at least a subset of the industrial business operations based in part on the received data, the prognostics engine comprising a plurality of

intelligent software machine agents and business agents for modeling and representing interactions between [the] a subset of machines, for efficiently optimizing the industrial business operations; and

an optimization component that selects a desired operating point as an optimum performance point within an allowable range of operation about a system set point according to performance characteristic associated with the industrial business operations at least one of the components in the system and controls at least one component according to the desired operating point, for a global optimization of the industrial business operation as a whole.

48. (Currently amended) The system of claim 47 [1], wherein the optimization component correlates component performance information associated with one ore more components in the system comprising at least a pump, a motor and a motor drive in order to derive correlated process performance information.

49. (Previously Presented) The system of claim 48, wherein the optimization component selects the desired operating point as the optimum performance point within the allowable range of operation according to the correlated process performance information.